1. Determine whether the function below is 1-1.

$$f(x) = (5x - 16)^3$$

A. No, because the domain of the function is not $(-\infty, \infty)$.

B. No, because there is an x-value that goes to 2 different y-values.

C. No, because the range of the function is not $(-\infty, \infty)$.

D. No, because there is a y-value that goes to 2 different x-values.

E. Yes, the function is 1-1.

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2. Determine whether the function below is 1-1.

$$f(x) = 9x^2 - 30x + 25$$

A. Yes, the function is 1-1.

B. No, because the range of the function is not $(-\infty, \infty)$.

C. No, because there is an x-value that goes to 2 different y-values.

D. No, because the domain of the function is not $(-\infty, \infty)$.

E. No, because there is a y-value that goes to 2 different x-values.

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3. Find the inverse of the function below (if it exists). Then, evaluate the inverse at $x = 12$ and choose the interval that $f^-1(12)$ belongs to.

$$f(x) = 3x^2 + 2$$

A. $f^{-1}(12) \in [4.74, 5.36]$

B. $f^{-1}(12) \in [2.03, 4.21]$

C. $f^{-1}(12) \in [6.45, 8.02]$

D. $f^{-1}(12) \in [1.74, 1.9]$

E. The function is not invertible for all Real numbers.

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4. Subtract the following functions, then choose the domain of the resulting function from the list below.

$$f(x) = 6x^4 + 6x^2 + 7x + 7 \text{ and } g(x) = \sqrt{-5x - 15}$$

A. The domain is all Real numbers except $x = a$, where $a \in [-14.4, 0.6]$

B. The domain is all Real numbers less than or equal to $x = a$, where $a \in [-4, 0]$

C. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [-5.5, -0.5]$

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [-9.67, -4.67]$ and $b \in [-8.83, -4.83]$

E. The domain is all Real numbers.

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5. Choose the interval below that f composed with g at $x = 1$ is in.

$$f(x) = -2x^3 + 2x^2 + x \text{ and } g(x) = 4x^3 - 2x^2 - 2x$$

A. $(f \circ g)(1) \in [-1.42, 0.53]$

B. $(f \circ g)(1) \in [-1.42, 0.53]$

C. $(f \circ g)(1) \in [4.53, 5.32]$

D. $(f \circ g)(1) \in [5.81, 6.62]$

E. It is not possible to compose the two functions.

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6. Find the inverse of the function below. Then, evaluate the inverse at $x = 7$ and choose the interval that $f^-1(7)$ belongs to.

$$f(x) = e^{x-3} - 3$$

A. $f^{-1}(7) \in [5.1, 6.59]$

B. $f^{-1}(7) \in [-1.53, 0.15]$

C. $f^{-1}(7) \in [-1.53, 0.15]$

D. $f^{-1}(7) \in [-1.96, -1.38]$

E. $f^{-1}(7) \in [-1.96, -1.38]$

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7. Choose the interval below that f composed with g at $x = 1$ is in.

$$f(x) = x^3 - 1x^2 - 3x + 1 \text{ and } g(x) = 3x^3 - 3x^2 + 2x$$

A. $(f \circ g)(1) \in [5, 13]$

B. $(f \circ g)(1) \in [-49, -41]$

C. $(f \circ g)(1) \in [-4, 2]$

D. $(f \circ g)(1) \in [-43, -39]$

E. It is not possible to compose the two functions.

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8. Multiply the following functions, then choose the domain of the resulting function from the list below.

$$f(x) = \sqrt{4x - 26} \text{ and } g(x) = 6x^3 + 9x^2 + 8x + 1$$

A. The domain is all Real numbers except $x = a$, where $a \in [3.75, 11.75]$

B. The domain is all Real numbers less than or equal to $x = a$, where $a \in [2.67, 12.67]$

C. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [4.5, 10.5]$

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [4.2, 8.2]$ and $b \in [-7.67, 0.33]$

E. The domain is all Real numbers.

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9. Find the inverse of the function below (if it exists). Then, evaluate the inverse at $x = 14$ and choose the interval that $f^-1(14)$ belongs to.

$$f(x) = 5x^2 + 3$$

A. $f^{-1}(14) \in [1.74, 1.9]$

B. $f^{-1}(14) \in [3.47, 3.7]$

C. $f^{-1}(14) \in [4.46, 4.89]$

D. $f^{-1}(14) \in [1.48, 1.69]$

E. The function is not invertible for all Real numbers.

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10. Find the inverse of the function below. Then, evaluate the inverse at $x = 8$ and choose the interval that $f^{-}1(8)$ belongs to.

$$f(x) = e^{x+4} - 2$$

A. $f^{-1}(8) \in [0.47, 0.65]$

B. $f^{-1}(8) \in [-1.94, -1.15]$

C. $f^{-1}(8) \in [-1.35, -0.49]$

D. $f^{-1}(8) \in [6.13, 6.88]$

E. $f^{-1}(8) \in [-0.27, 0.15]$
